

### Patent Claims

1. A method for producing synthetic silica glass, comprising the steps of:
  - a) forming a gas stream containing a vaporizable initial substance which can be converted into  $\text{SiO}_2$  by means of oxidation or flame hydrolysis,
  - b) supplying the gas stream to a reaction zone in which the initial substance is converted so as to form amorphous  $\text{SiO}_2$  particles,
  - c) depositing the amorphous  $\text{SiO}_2$  particles on a support so as to form an  $\text{SiO}_2$  layer,
  - d) vitrifying the  $\text{SiO}_2$  layer either during or following deposition of the  $\text{SiO}_2$  particles to obtain the silica glass,characterized in that
  - e) a mixture of a monomeric silicon compound containing a singular Si atom and of an oligomeric silicon compound containing several Si atoms is used as the initial substance, with the proviso that the oligomeric silicon compound in the mixture contributes less than 70% to the total silicon content.
2. The method according to claim 1, characterized in that the oligomeric silicon compound in the mixture contributes less than 60% to the total silicon content.
3. The method according to claim 1 or 2, characterized in that the oligomeric silicon compound in the mixture contributes at least 30% to the total silicon content.
4. The method according to any one of the preceding claims, characterized in that a polyalkylsiloxane is used as the oligomeric silicon compound.
5. The method according to claim 4, characterized in that the polyalkylsiloxane is an octamethylcyclotetrasiloxane (OMCTS) or a decamethylcyclopentasiloxane (DMCPS).

6. The method according to any one of the preceding claims 1 to 5, characterized in that a chlorine-free alkoxysilane is used as the monomeric silicon compound.
7. The method according to claim 6, characterized in that the alkoxysilane is methyltrimethoxysilane (MTMS) or a tetramethoxysilane (TMS).
8. The method according to any one of the preceding claims, characterized in that silicon tetrachloride ( $\text{SiCl}_4$ ) is used as the monomeric silicon compound.
9. The method according to claim 5 and claim 7, characterized in that a mixture is used in which the ratio of the mixing amounts of MTMS and OMCTS, based on the molecular silicon amount, is in the range of 40:60 to 60:40, preferably around 45:55.
10. The method according to claim 5 and claim 8, characterized in that a mixture is used in which the ratio of the mixing amounts of  $\text{SiCl}_4$  and OMCTS, based on the molecular silicon amount, is between 30:70 and 70:30.
11. The method according to any one of the preceding claims, characterized in that a chlorine-free silicon compound is used as the oligomeric silicon compound.
12. The method according to any one of the preceding claims, characterized in that the silicon compounds are vaporized separated from each other and that the mixture is produced before or during method step b).